

Chapter 7

On the meaning of some epistemic adverbs in Portuguese¹

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INTRODUCTION

The expression of modality in natural languages involves the use of different linguistic means, both grammatical and lexical. Lexical devices for the expression of modality include words from different word classes, among which many adverbs, such as *certainly*, *possibly* and *obviously*, and many others.

As has been observed by different authors (cf., e.g., Simon-Vandenberghe and Aijmer 2007; Celle 2011), the meaning and the pragmatic and discourse functions of these adverbs vary from language to language. Thus, a description of the meaning of such a class of modal operators will benefit from their observation in several languages. This paper focuses on some of these adverbs in Portuguese, trying to figure out the dimensions involved in their meaning. The considered adverbs are those listed in (1):

- (1) *alegadamente* ('allegedly'); *certamente* ('certainly'); *eventualmente* (roughly 'by chance'); *possivelmente* ('possibly'); *presumivelmente* ('presumably'); *supostamente* ('supposedly')

These adverbs take a proposition under their scope and express lack of (absolute) certainty. That is, the assertion of any sentence with one of

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these operators indicates that the speaker does not express an absolute commitment to the truth of the asserted proposition. In this sense, they can be classified as epistemic modal operators, using the term ‘epistemic’ in a broad sense, since at least *alegadamente* would more appropriately be classified as a reportative adverb than as an epistemic one. Nevertheless, *allegedly* also allows the speaker to express lack of commitment to the truth of the proposition, a feature that *allegedly* shares with the other adverbs listed in (1). Moreover, as has been stressed in the literature, epistemic modality and evidentiality (which includes reportative evidentiality) are clearly related concepts.

Apart from the adverbs in (1), there are several other expressions that communicate uncertainty (e.g. *se calhar* ‘maybe’, *por certo* ‘for sure’; *ao que parece* ‘apparently’), as there are many other adverbs which can also be classified as epistemic (e.g., *obviamente* ‘obviously’, *evidentemente* ‘evidently’, *naturalmente* ‘naturally’). At least at first sight, adverbs like *evidently* and *obviously* differ from the ones indicated in (1) in the extent that they evoke a reasoning process (cf. Barbaresi 1987), contrary to the ones listed in (1). In other words, adverbs like *evidently* are inferential operators (cf. also Squartini 2008), while the adverbs in (1) do not seem to express an inference.

The investigation of the differences between various subclasses of epistemic adverbs, such as *evidently* and *obviously*, on one side, and *possibly* and *certainly*, on the other side, is an interesting area and might help to disentangle different categories. However, in this paper attention will be restricted to the adverbs listed in (1), trying to figure out the differences among them and the dimensions of meaning relevant for their characterization.

The chapter is organized as follows: section 1 presents and discusses classical classifications of modal adverbs of the kind of those listed in (1); in section 2 it is shown that such classifications raise several problems when applied to the considered Portuguese adverbs, after what, in sections 3 and 4, the proposal will be made that the primary function of the considered adverbs is not to express some degree of belief; the last section presents the conclusions.

1. CLASSICAL ASSUMPTIONS – REPORTATIVE AND EPISTEMIC MODALS

The meaning of the kind of adverbs under consideration has not been given detailed attention in Portuguese. As for other languages, over the last years a considerable amount of literature has been devoted to the analysis of epistemic adverbs.

One line that has been significantly explored is concerned with pragmatic and discourse factors involved in the use of epistemic adverbs. Another major issue that has been taken into consideration in the literature on epistemic adverbs is the identification of neighboring categories of epistemic modality, such as evidentiality, mirativity, inferentiality or non factuality.

For this second line of research, concerning the disentangling of neighboring categories usually subsumed under a larger term, the work of Squartini 2007, 2008, 2010, among others, and Pietrandrea 2005 and 2007 is particular relevant. Both authors explore the division between epistemic modality and evidentiality, arguing for the consideration of other categories within the same realm. Pietrandrea considers “non factual [forms]”, “epistemic forms”, “epistemic/evidential forms” and “purely evidential forms”. Squartini 2010 argues for the distinction between “dubitative”, “inferential” and “conjectural” domains, some adverbs, such as French *probablement*, being conjectural and not dubitative. The analysis of the adverbs (and adverbial constructions, such as Italian *second me* ‘in my view’) considered by these authors is based on parameters such as the source of evidence and the mode of knowing and clearly shows that « the epistemicity is much more varied internally than so far assumed » (Squartini 2010, p. 125). Their investigation allows for a finer classification than the traditional division between reportative and epistemic modals that is usually considered in relation to sentence adverbs and adverbial expressions.

Another parameter that has been considered in the analysis of modal adverbs is the degree of confidence in the truth of the modalised proposition.

Despite the degree of granularity that is considered within the epistemic/evidential domain, one might say that the description of the meaning of epistemic adverbs has been based on these two parameters: source of knowledge (plus mode of getting it) and the degree of belief that the adverbs express. The basic information that is classically assumed is summarized in the English grammar of Huddleston & Pullum 2002 and in the Spanish grammar of Bosque & Demonte 1999, which will now be taken into consideration.

The classification proposed by Huddleston and Pullum of ‘clause-oriented adjuncts’ is shown in table I:

clause-oriented adjuncts	
i. domain	<i>Politically, the country is always turbulent.</i>
ii. modality	<i>This is necessarily rather rare.</i>
iii. evaluation	<i>Fortunately, this did not happen.</i>
iv. speech act-related	<i>Frankly, I'm just not interested.</i>
v. connective	<i>Moreover, he didn't even apologise.</i>

Table I – Clause-oriented adjuncts in Huddleston & Pullum 2002

The class of the clause-oriented adjuncts that express modality is subdivided into four groups, as shown in table II, considering different « levels of strength, according to the speaker's commitment to the truth of the proposition, or to the actualization of the situation, expressed by their complement » (Huddleston & Pullum 2002, p. 768):

I (strong items)	<i>assuredly</i> <i>certainly</i> <i>clearly</i> <i>definitely</i> <i>incontestably</i> <i>indubitably</i> <i>ineluctably</i> <i>inescapably</i> <i>manifestly</i> <i>necessarily</i> <i>obviously</i> <i>patently</i> <i>plainly</i> <i>surely</i> <i>truly</i> <i>unarguably</i> <i>unavoidably</i> <i>undeniably</i> <i>undoubtedly</i> <i>unquestionably</i>
II (quasi-strong)	<i>apparently</i> <i>doubtless</i> <i>evidently</i> <i>presumably</i> <i>seemingly</i>
III (medium)	<i>arguably</i> <i>likely</i> <i>probably</i>
IV (weak)	<i>conceivably</i> <i>maybe</i> <i>perhaps</i> <i>possibly</i>

Table II – Modal clause-oriented adjuncts in Huddleston & Pullum 2002

Allegedly is explicitly left out of the table, on the basis of the statement that it « absolves the speaker from responsibility for the residual proposition. This one has the status of an allegation, and the speaker can't say whether it is true. » (Huddleston & Pullum 2002, p. 769).

Thus, the classification proposed by Huddleston and Pullum 2002 divides the modal adverbs on the basis of the degree of commitment that the speaker expresses towards the truth of the proposition, the scale ranging from no commitment – expressed by *allegedly* – to almost absolute commitment– expressed by the strong items.

As for the Spanish grammar of Bosque and Demonte 1999 (the relevant chapter is the one written by Kovacci), the macro classes of sentence adverbs are roughly the same as those proposed by Huddleston and Pullum, despite terminological variation, plus the class of adverbs of frequency. The proposed classification is given in table III:

- i. Adverbs of frequency (e.g., *habitualmente* 'usually', *mensualmente* 'monthly')
- ii. Adverbios nocionales (e.g., *politicamente* 'politically'; as in *politicamente, Canadá es un dominio británico* 'politically, Canada is Britanic')
- iii. Adverbios evaluativos (e.g., *lamentablemente, felizmente*)
- iv. Adverbios como tópicos: personalmente (as in *personalmente, yo prefiero los perros* 'personally, I prefer dogs').
- v. Adverbios del modus
 - 1) related to modality (e.g., *seguramente* 'safely', *probablemente* 'probably')
 - 2) speech act adverbs (e.g., *francamente* 'frankly')
- vi. Adverbios conjuntivos (e.g., *consequentemente* 'consequently', *además* 'moreover')

Table III – Sentence adverbs in Kovacci 1999

The class of adverbs related to modality is subdivided into three classes:

- A. Adverbs that express a degree of belief (« Indicadores y reforzadores de actitud »):

seguramente 'assuredly', *probablemente* 'probably', *tal vez* 'maybe', *posiblemente* 'possibly', *difícilmente* 'hardly', *quizá(s)* 'perhaps', *acaso* 'perhaps'

The claim is made that they are linked to a scale of doubt, *difícilmente* occupying one extreme of this scale, expressing almost negation, and *seguramente* occupying the opposite value, expressing almost certainty.

- B. Adverbs that restrict the assertion (« Restrictivos del valor de verdad de la aserción »):

supuestamente 'supposedly', *presuntamente*, *presumiblemente* 'presumably', *aparentemente* 'apparently', *virtualmente* 'virtually', *prácticamente* 'practically' and *verosimilmente* 'likely'

The claim is made that they express the notions of supposition or appearance and are not scalar predicates, contrary to the ones of class A.

- C. Adverbs that reinforce the assertion (« Reforzadores del valor de verdad de la aserción »):

indudablemente 'undoubtedly', *indiscutiblemente*, *incuestionablemente* 'unquestionably', *innegablemente* 'undeniably',

ciertamente ‘certainly’, *verdaderamente* ‘truly’, *evidentemente* ‘evidently’, *obviamente* ‘obviously’

The claim is made that the function of these adverbs is to reinforce the acceptance of the truth of the proposition which is expressed in assertive speech acts.

The classification proposed by Kovacci 1999 links the modal sentence adverbs to two parameters: the expression of uncertainty (adverbs of class A) and restriction or reinforcement of the assertion (classes B and C respectively). Simplifying somehow, one might say that the basis for this division is not significantly different from the one proposed by Huddleston and Pullum 2002. In fact, given that an assertive speech act compromises the speaker with the acceptance of the truth of the proposition, the adverbs of classes B and C have the function of mitigating and reinforcing, respectively, such acceptance, and, thus, they will be linked to the expression of certainty or uncertainty, as the ones of class A. The difference between the adverbs of class A, on one side, and those of classes B and C, on the other side, will turn out to be based on whether the adverbs operate at the illocutionary level or at a more internal level, to quote the terms of Hengeveld 2004.

2. THE DEGREES OF BELIEF APPROACH

The proposals described in the previous section relate modal sentence adverbs to the expression of degrees of uncertainty. This idea doesn’t seem to have been questioned in other works on modal adverbs (cf., e.g., Simon-Vandenberghe and Aijmer 2007, Squartini 2010 or Pietrandrea 2007).

Applying this parameter to the Portuguese adverbs listed in (1), the observation follows that *certamente* expresses a high degree of commitment to the truth of the modalised proposition; while the adverbs *eventualmente* and *possivelmente* express a lower degree of commitment; the adverbs *presumably* and *plausibly* point to medium values of the scale. As for the adverb *supostamente*, data such as (2) suggest that is similar to *certainly*, expressing a high degree of commitment on the part of the speaker:

- (2) « E é por isso que não tenho (...) a intenção de desarmar, agora que a eleição está consumada e que, supostamente, começa uma nova era. » (CetemPúblico², 8039)

‘And that is why I don’t have the intention to give up, now that the election is done and that, supposedly, a new era begins.’

Finally, the adverb *alegadamente* is a reportative adverb and does not express any degree of commitment on the part of the speaker to the truth of the proposition.

On the basis of these observations, and following the classical division between epistemic and reportative adverbs, the following classification might be observed:

Epistemic adverbs	weak	<i>eventualmente</i> (‘by chance’), <i>possivelmente</i> (‘possibly’)
	medium	<i>presumivelmente</i> (‘presumably’), <i>plausivelmente</i> (‘plausibly’)
	strong	<i>certamente</i> (‘certainly’), <i>supostamente</i> (‘supposedly’)
Reportative adverbs		<i>alegadamente</i> (‘allegedly’)

Table IV – Epistemic and reportative adverbs

The first class – epistemic adverbs – would be formed by those adverbs that express an attitude of uncertainty on the part of the speaker; the second class would be formed by those adverbs that relate someone else to the acceptance of the truth of the proposition, the speaker being merely reporting such an attitude.

This proposal faces at least three problems. The first one is the number of subclasses of epistemic adverbs. According to this classification, the adverbs *eventualmente* and *possivelmente* are both weak, expressing a low degree of commitment to the truth of the proposition. However, *possivelmente* may express a higher degree of commitment than *eventualmente*, as shown by the contrast between (3a) and (3b):

2. Electronic corpus of Portuguese available at www.linguateca.pt.

- (3) a. « O jornal fica mais arrumado e possivelmente o Roteiro irá ser autonomizado para que as pessoas o possam guardar durante a semana. » (*CetemPúblico*, 11997)

‘The newspaper will be better organized and possibly the Roteiro will turn out to be autonomous, so that people can keep it during the week.’

- b. O jornal fica mais arrumado e eventualmente o Roteiro irá ser autonomizado para que as pessoas o possam guardar durante a semana.

‘The newspaper will be better organized and by chance the Roteiro will turn out to be autonomous, so that people can keep it during the week.’

In (3b), the proposition under the scope of *eventualmente* describes a state of affairs that might occur, but by pure chance. On the contrary, in (3a) the same proposition, under the scope of *possivelmente*, describes a state of affairs whose chances to occur are reasonable. In fact, (3a) could be felicitously asserted in a context where the editor of the newspaper describes a proposal (to give autonomy to a part of the edition) that is under discussion, though not determined yet. On the contrary, (3b) indicates that no such proposal was considered ever before, though it is a hypothesis.

Moreover, the adverb *possivelmente* may be preceded by *muito* (‘quite’), expressing a higher degree of commitment to the truth of the modalised proposition, contrary to *eventualmente*:

- (4) a. Muito possivelmente, o contrato vai ser assinado na próxima semana.

‘Quite possibly, the contract will be signed next week.’

- b. *Muito eventualmente, ...

This suggests that the adverb *possivelmente* expresses a higher degree of belief than *eventualmente*, leading to the hypothesis that extra subclasses of epistemic adverbs should be considered, rather than just three subclasses. Nevertheless, though in cases such as (3a) and (3b) the contrast between *possivelmente* and *eventualmente* seems to be related to different degrees of epistemic commitment, in other cases, a similar contrast between the two adverbs does not seem to exist, as shown by the following examples, where both sentences express a low degree of belief on the part of the speaker:

- (5) a. Possivelmente, a Ana até já está em casa.

‘Possibly Ana is even at home by now.’

- b. Eventualmente, a Ana até já está em casa.

‘Perhaps Ana is even at home by now.’

These data suggest that something else, apart from the degree of belief, may distinguish the adverbs *possivelmente* and *eventualmente*. In the next section, the observation will be made that the first of these adverbs is inferential, the second one being conjectural, following Squartini 2010 in disentangling these two categories. For now, the observation to be stressed is that an analysis based on the degree of belief does not clarify the distinction between these two adverbs.

The second problem with the classification stated in Table IV has to do with the division between epistemic and reportative adverbs. Though *allegedly* may only have a reportative reading and most of the other adverbs may only have an epistemic reading, expressing some degree of commitment on the part of the speaker towards the truth value of the proposition, the adverbs *supostamente* and *presumivelmente* may have both readings, as shown by the following examples:

- (6) a. « Segue-se o celeberrimo monstro do Loch Ness, que supostamente vive num idílico lago da Escócia. » (*CetemPúblico*, 59522)

‘Next comes the famous Loch Ness monster, that supposedly lives in an idyllic lake in Scotland.’

- b. « Antes, próximo de Coimbra, a GNR deteve três jovens que supostamente molestaram sexualmente diversas jovens. » (*CetemPúblico*, 152910)

‘Before, near Coimbra, the police arrested three young men who supposedly molested several young women.’

- (7) a. « Ao contrário de Lula, o ministro sabia, presumivelmente, que a ofensa seria publicada. » (*CetemPúblico*, 646487)

‘Unlike Lula, the minister knew, presumably, that the offense would be published.’

- b. « Segundo a polícia os dois indivíduos encontravam-se no interior onde, presumivelmente, se preparavam para furtar. » (*CetemPúblico*, 724458)

‘According to the police, the two men were inside the building where, presumably, they were preparing to commit a robbery.’

In the second member of each pair of sentences the underlined adverbs have a reportative reading. They could be replaced by *allegedly* without

any differences in meaning. On the contrary, in (6a) and (7a), by using the same adverbs, the speaker expresses his own belief that the relevant proposition might be true. Thus, these adverbs may be classified as epistemic modal adverbs, considering data such as (6a) and (7a), or they can be classified as reportative adverbs, on the basis of data like (6b) and (7b). Moreover, it is not always easy to determine whether the adverbs *supostamente* and *presumivelmente* are being used with an epistemic or with a reportative sense. In example (8), below, the underlined adverb could easily be interpreted as epistemic, expressing some confidence on the part of the speaker that the relevant proposition is true. This would be the preferred reading if, for instance, the sentence was part of a police report. However, if the same sentence is written by a journalist in a newspaper, for instance, the adverb could be preferably interpreted as reportative, being equivalent to *allegedly*:

- (8) « Os quatro camiões (...) deixaram ontem o porto de Setúbal, presumivelmente com destino ao país vizinho. » (*CetemPúblico*, 223939)

‘The four trucks (...) left the harbor of Setúbal yesterday, presumably having the neighboring country for destination.’

This being so, an analysis of the adverbs based on the division between reportative and epistemic adverbs faces the problem of classifying the adverbs *presumivelmente* and *supostamente*. They may either express some degree of belief on the part of the speaker towards the relevant proposition, being of the same type as *possivelmente* and *certamente*, or they may signal a reportative attitude of the same type as *alegadamente*.

Finally, there is a third problem for the classification of the considered adverbs as proposed in Table IV. If the meaning of the epistemic adverbs varies in terms of the degrees of belief in the relevant proposition, it should be impossible for the weak adverbs to co-occur with operators expressing a high degree of belief or for the strong adverbs to co-occur with weak modal operators. However, this prediction is not confirmed. In fact, the following four combinations are possible:

- Strong epistemic adverb + Strong modal verb:

- (9) « Deve certamente haver outras maneiras de salvar uma pessoa (...). » (*CetemPúblico*, 87872)

‘There must certainly exist other ways to save a person, (...)’

- Weak epistemic adverb + Weak modal verb:

- (10) a. « Mas não só Bob Dole não considera essa uma prioridade nacional, como sabe que possivelmente poderia perder ainda mais votos. » (*CetemPúblico*, 26507)

‘But not only doesn’t Bob Dole consider this a national priority, he also knows that possibly he could lose even more votes.’

- b. « (...) aponta para novas soluções organizativas de que pode eventualmente emergir uma deriva centralizadora e burocratizante, consideram os magistrados. » (*CetemPúblico*, 562480)

‘(...) points to new solutions of organization from which might perhaps emerge a tendency to centralize and increase the bureaucracy, the magistrates consider.’

- Strong epistemic adverb + Weak modal verb:

- (11) « A base (...) subiu dos 10 por cento para 12 por cento, podendo certamente vir a sofrer novas subidas. » (*CetemPúblico*, 1463889)

‘The basis raised from 10% to 12% and certainly may raise even more.’

- Weak epistemic adverb + Strong modal verb:

- (1) a. « Contudo, a AI parece pouco receptiva a estas reivindicações devendo, possivelmente, adoptar a proposta da divisão do organismo em dois departamentos distintos. » (*CetemPúblico*, 46737)

‘However, AI seems not to be particularly receptive to these claims, and shall possibly adopt the proposal of dividing the organism into two separate departments.’

- b. « A Guiné-Bissau (...) só no fim deste ano deverá ter eventualmente as suas eleições (...) » (*CetemPúblico*, 1157291)

‘Only at the end of this year shall Guinea-Bissau perhaps have its elections (...)’

In these examples the modal verbs may express circumstantial or root modality, a reading which is unproblematic for the idea that the modal adverbs occurring in these sentences do express some degree of belief. However, the epistemic reading of the modal verbs is also available. For instance, (12a) expresses a prediction; the most natural reading of the modal verb being the epistemic one: the speaker is expressing his belief about what will be the case.

Given this epistemic reading of the modal verbs, the first two combinations, corresponding to examples (9) and (10), can be seen as cases of modal harmony, as proposed by, e.g., Huddleston & Pullum 2002. However, if the function of the modal adverbs occurring in these

sentences is to express a degree of (un)certainty, the second two combinations, corresponding to examples (11) and (12), should be impossible, since the modal verb and the modal adverb express different degrees of belief in the same proposition. Nevertheless, such constructions are grammatical and meaningful, even in the epistemic reading of the modal verb.

3. MODAL BASE AND MODAL FORCE

The observations made in the preceding section are problems for the intuitive idea that the considered adverbs signal the degree of belief in the truth of the modalised proposition. In this section a different hypothesis will be presented, according to which the considered adverbs are marks that point to the kind and amount of information that the speaker relies on to state the proposition under the scope of the adverb.

Apparently, the hypothesis that the considered adverbs do not directly signal a degree of belief doesn't account for the difference between, e.g., *possivelmente* and *certamente*. It seems evident that the second adverb expresses a higher degree of belief than the first one. However, these different degrees of belief might be a consequence of the fact that *certamente* indicates that the speaker has strong evidence to support his inference, contrary to *possivelmente*, which indicates a low amount of evidence. Thus, the degree of belief expressed by the considered modal adverbs will be an inference, rather than part of their meaning.

On the basis of this hypothesis, the difference between *certamente* and *possivelmente* is based on the amount of evidence that the speaker relies on, the first one signaling that the speaker has strong evidence, contrary to the second one. Still, the adverb *possivelmente* indicates that the speaker has some information which he relies on. On the contrary, the adverb *eventualmente* states that the speaker has no information whatsoever to sustain the truth of the modalised proposition. It merely indicates that the proposition under its scope is a hypothesis. The state of affairs described by the relevant proposition is conceivable, but there is no evidence that it will turn out to be true or false. This is shown by the following examples:

- (13) « Caso a falsificação não tivesse sido descoberta, os técnicos afirmam que a peça acabaria por provocar uma avaria e, eventualmente, um acidente grave (...) » (CetemPúblico, 558070)

‘If the forgery had not been discovered, the experts say that the piece would have caused damage and perhaps a serious accident (...)’

- (14) « Se ficar satisfeito, continuarei eventualmente nesta área. »
(CetemPúblico, 560197)

‘If I am satisfied, perhaps I will stay in this area.’

By asserting these sentences, the speaker gives no indication that he has some evidence that the state of affairs described by the proposition under the scope of *eventualmente* will be verified. He is merely expressing a conjecture. If some information exists on which the speaker relies to admit that the state of affairs described by the modalised proposition might be true, the adverb *eventualmente* is inadequate, contrary to *possivelmente*:

- (15) a. Possivelmente a Ana já está em casa. Ela saiu há quase duas horas.
‘Possibly Ana is at home by now. She left almost two hours ago.’
b. #Eventualmente a Ana já está em casa. Ela saiu há quase duas horas.

The second sentence of (15a) and (15b) – she left almost two hours ago – specifies some of the information on which the speaker bases his inference concerning Ana being home. That is, while in (13) and (14) the modalised proposition is a conjecture, the first sentence of (15a) and (15b) expresses an inference.

This being so, it seems that the difference between *eventualmente* and *possivelmente* relies on the fact that the first adverb is conjectural and the second one is inferential (cf. Squartini 2010 for a similar conclusion concerning French adverbial expressions). Though this might be the case, something else must be said. The fact that *possivelmente* is inferential means that the proposition under its scope results from an inference. It does not mean that the adverb signals such an inference, otherwise it could not co-occur with a sentence connective like *therefore*, as it can: ‘Perhaps Ana is at home by now. She left almost two hours ago.’

- (16) A Ana saiu há quase duas horas. Por isso, possivelmente já está em casa.
‘Ana left almost two hours ago. Therefore, possibly she is already home.’

Thus *possivelmente* does not signal a deduction, though the proposition it introduces is an inference. Apparently, *possivelmente* indicates that

the conclusion (i.e., the proposition under its scope) is based on partial knowledge and, therefore, is not definite. For instance, in (16) the inference that Ana might be at home follows from the fact that she left two hours ago, together with common knowledge such as the amount of time that normally she needs to arrive home and so on. Yet, there might exist something that prevented Ana from having already reached home. She might have had an accident, she might have gone somewhere else before going home, and so on. Thus, the inference that she is already home is based on partial information.

This being so, *possivelmente* relativises the inference. It signals that the degree of belief in the inferred proposition is low, because based on partial knowledge. The fact that *possivelmente* is inferential, *eventualmente* being conjectural, does not prevent the consideration that they have the same function: to state the amount of information that the speaker relies on. The first adverb indicates that the speaker has some evidence to sustain the assertion, contrary to the second adverb, which indicates absence of evidence. In other words, both adverbs quantify the amount of information on which the assertion is based.

To sum up, the difference between *certamente*, *possivelmente* and *eventualmente* is related to the amount of information that the speaker relies on to state the proposition under the scope of the adverb. *Certamente* signals that the speaker has a large amount of information; *possivelmente* signals that he has a low amount of information and *eventualmente* signals that he has no information at all.

None of these three adverbs indicates that the information on which the speaker bases his assertion is known to someone else apart from the speaker. In this respect, they differ from the adverbs *presumivelmente*, *supostamente* and *alegadamente*. In fact, the following discourse is coherent, but it would not be so if some of these adverbs were used instead of *possivelmente*:

- (17) Possivelmente a Ana já está em casa. Ela saiu há quase duas horas, embora ninguém soubesse que ela tinha saído.

‘Possibly Ana is at home by now. She left almost two hours ago, though nobody knew that she had left.’

The adverbs *presumivelmente* and *supostamente* would indicate that the speaker is relying on information that belongs to the common ground, while *alegadamente* would indicate that the speaker is reporting information from others. In either case, the information expressed by the adverb would be incoherent with the last clause.

The adverb *alegadamente* indicates that the speaker relies purely on information from others. It does not signal that he has some evidence of his own to sustain the proposition. As for the adverbs *presumivelmente* and *supostamente*, as seen above, they are ambiguous between an interpretation where they have the same meaning as *alegadamente* and another one where the speaker expresses some degree of self-commitment to the truth of the proposition (cf. examples (6) and (7), in section 2). In the case of this last reading, the inference is allowed that the speaker has some evidence to sustain the belief that the relevant proposition might be true and that other persons share the same evidence. Thus, the adverbs *presumivelmente* and *supostamente* indicate that the speaker relies on information from others, which he may share (in the non reportative reading of these adverbs) or not (in the case of the reportative reading).

This being so, the six considered adverbs may be classified along two parameters, as shown in the following table:

	Source of Information	Modal Force
<i>eventualmente</i>	S(peaker)	Null
<i>possivelmente</i>	S	Weak
<i>certamente</i>	S ³	Strong
<i>presumivelmente</i>	O(thers) + (S)	Strong ⁴
<i>supostamente</i>	O + (S)	Weak ⁵
<i>alegadamente</i>	O	Null

Table V – Proposal for a new classification

The first parameter – source of information – respects the kind of information that the speaker relies on to assert p: personal information or information from others. The second parameter – modal force – concerns the amount of evidence that the speaker has to sustain p.

This classification allows the treatment of *alegadamente* on the basis of the same parameters as the other considered adverbs. As seen above, a classification of these adverbs based on the degree commitment of the speaker towards the proposition under their scope

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3. I assume that both the adverbs *certamente* and *possivelmente* point to information that may come exclusively from the speaker (i.e., it does not have to belong to the common ground or to be shared by someone else, apart from the speaker). I do not assume that the same is verified in the morphologically related nouns *possibilidade* ('possibility') and *certeza* ('certainty'), cf. Ballier 2010.
 4. In the case of the non reportative reading of the adverb. In the reportative reading, there is no difference between this adverb and *alegadamente* ('allegedly').
 5. *Idem*.

does not allow an easy integration of *alegadamente* into the classification. In fact, a classification along such lines either leaves out the adverb *alegadamente* (and leads to the problem that the adverbs *supostamente* and *presumivelmente* may also have a reportative reading, in which case they are no different from *alegadamente*, though they also have a non reportative reading) or else it leads to its classification as a modal adverb that expresses no commitment on the part of the speaker, in which case it does not allow a clear distinction between *alegadamente* and *eventualmente*, since these two adverbs signal a weak commitment on the part of the speaker to the truth of the proposition.

The two other problems that were observed for the traditional classifications also seem to have a natural resolution within the proposed analysis and classification of the considered adverbs. In fact, the assumption that these adverbs do not primarily indicate the degree of commitment to the truth of the proposition, but rather indicate the source and amount of evidence that the speaker relies on to state *p* captures the distinction between *eventualmente* and *possivelmente*. These two adverbs differ in the fact that the latter indicates that the speaker has some evidence on which to sustain the proposition, contrary to the former. Finally, the proposed analysis accounts for the possibility of the considered adverbs to co-occur with modal verbs with an epistemic reading, as I will try to show in the next section.

4. MODAL ADVERBS AND MODAL VERBS

Portuguese has three modal verbs (cf., e.g., Oliveira 2003): *poder*, *dever* and *ter de/que*, all of which may have an epistemic reading, as shown by the following examples:

(18) a. *Pode chover.*

‘It might rain.’

b. *A Ana deve estar em casa.*

‘Ana must be home.’

c. *A Ana mora em Coimbra ou em Lisboa. Em Lisboa não mora; por isso, tem de morar em Coimbra.*

‘Ana lives in Coimbra or in Lisbon. She doesn’t live in Lisbon; therefore, she has to live in Coimbra.’

The three modal verbs differ in the degree of belief they express, *poder* expressing the weaker degree and *ter de / que* the highest.

Moreover, as known from the literature on modal verbs (cf., e.g., Dendale 1994, Kratzer 1991, Portner 2009), the epistemic reading of the modal verbs involves an inference. This is captured by the semantics proposed by Kratzer 1991, which I will take into account.

Each proposition denotes a set of possible worlds: those worlds where the state of affairs described by the proposition is verified. At each point of the conversation, there is a set of possibilities that are open – the context set. A weak modal verb, like *poder*, indicates that within the context set there is at least one possible world where the proposition under its scope is verified. The strongest modal verb, *ter de / que*, indicates that in all the possible worlds that form the context set the proposition under its scope is verified. As for the modal verb *dever*, it indicates that the proposition under its scope is verified in a large number of possible worlds available at each point of the conversation, but not in all. Thus, the modal verbs are quantifiers over possible worlds, differing from each other in their modal force. In addition, the proposition under the scope of the modal verb – verified in at least one possible world, in one but not all possible worlds, or in all the possible worlds that form the context set – follows from a set of assumptions, which might be conceived as another set of possible worlds: the modal base⁶. That is, given the facts such and such, the proposition *p* might / may / must / has to ... be true. Thus, ‘*poder p*’ means that *p* is compatible with the modal base; ‘*ter de p*’ means that *p* follows from the modal base and ‘*dever p*’ means that *p* is a good possibility given the modal base.

The modal base contains propositions that describe facts of the world, as it might contain propositions whose truth value in the real world is undetermined. For instance, in (18b) the modal base contains the information that Ana exists, that she has a home, and other facts from the world that are relevant for the processing of the sentence. In addition, the modal base might contain propositions that are not necessarily true in the world. For instance, it might contain worlds where Ana took a taxi to arrive home as well as worlds where she didn’t take a taxi. Some of the information encoded in the modal base is more relevant than other information to the inference expressed by the modal verb. For instance, the fact that France is a republic might have no

6. Kratzer considers two kinds of modal bases: circumstantial and epistemic modal bases. In the epistemic reading, the modal verbs take an epistemic modal base. Since the epistemic reading of the modal verbs is the only problematic one for the co-occurrence of modal verbs and the adverbs under analysis in this study, I will only consider epistemic modal bases.

relevance for the inference expressed in (18b), but the belief that Ana is sick and usually she stays home when she is sick will be relevant for this inference. Given that, let us consider the co-occurrence of modal verbs and modal adverbs.

In section 2 it was observed that the modal adverbs under consideration might co-occur with the modal verbs *dever* and *poder* with an epistemic reading. However, none of the modal adverbs can co-occur with the modal verb *ter de / que* in the epistemic reading:

(19) *Certamente a Ana tem de estar em casa.

‘Certainly Ana has to be home.’

The anomaly of (19) is easily explained. The modal verb *ter de* indicates that the proposition under its scope follows from the modal base. On the other hand, under the proposal under discussion, the modal adverb points to the modal base, *certamente* indicating that the speaker has strong evidence on which to base their inference. However, this modal adverb expresses some degree of uncertainty. It conveys that the information available to the speaker is not enough to guarantee absolute certainty. Therefore, there is a mismatch between the information conveyed by *certamente* and the one conveyed by *ter de*, which indicates that the proposition under its scope is a consequence of the modal base. As for the modal verbs *poder* and *dever*, none of them expresses the information that the proposition under its scope is verified in all the possible worlds accessible from the modal base. Thus, their meaning is compatible with the information conveyed by the considered modal adverbs.

Furthermore, the proposed analysis of the modal adverbs under consideration is compatible with the fact that modal verbs are inferential operators. The modal verb requires a modal base, signaling a relation between this modal base and the proposition it takes, while, according to the hypothesis presented in this paper, the modal adverb points to the modal base. Thus, those cases where a strong modal adverb, like *certamente*, co-occurs with *dever* and those where a weak modal adverb, like *possivelmente*, co-occurs with *poder* are not cases of modal harmony, contrary to what is assumed. That is, the function of the modal adverb is not to reinforce the epistemic degree expressed by the modal verb. Rather, its function is to point to the modal base taken by the modal verb.

Let us now consider the problematic cases where *dever* co-occurs with a weak modal adverb and those where *poder* co-occurs with a

strong modal adverb. For instance, let us consider again example (12a) reproduced below as (20):

- (20) « Contudo, a AI parece pouco receptiva a estas reivindicações devendo, possivelmente, adoptar a proposta da divisão do organismo em dois departamentos distintos. » (CetemPúblico, 46737)

‘However, AI seems to be not particularly receptive to these claims, and shall possibly adopt the proposal of dividing the organism into two separate departments’

The modal verb *dever* indicates that the proposition under its scope is a good possibility; i.e., the proposition is verified in a considerable number of possible worlds accessible from the modal base. On the other hand, *possivelmente* indicates that the speaker has little evidence to sustain his inference. These two pieces of information are not incompatible. One might have little evidence that something is or will be the case, while accepting that it might well be true. In other words, example (20) expresses the information that the speaker strongly believes that the proposition under the scope of *dever* has a good chance to be true (at least, it is more likely to be true than to be false), information given by the modal verb, though he has little evidence to sustain such belief, information given by the adverb *possivelmente*. Similarly, a sentence where the weak modal verb *poder* and the modal adverb *certamente* co-occur will express the information that the speaker has strong evidence to admit that p is true.

Though it might be strange to express simultaneously the belief that something has a good chance to be true and that one has little evidence to sustain such belief, I do not think that the expression of this information leads to a contradiction. As seen above, the modal base contains facts as well as beliefs and some of the information included in the modal base will be more directly relevant for the inference conveyed by the modal verb than other information. However, it is not impossible to base one’s inference on matters that might not be directly relevant for such an inference. For instance, consider the following examples:

- (21) a. O Paulo deve ganhar o jogo. Ele está a jogar muito melhor do que o adversário!

‘Paulo must win the game. He is playing much better than his adversary!’

- b. O Paulo deve ganhar o jogo. Ele tem sempre sorte!⁷
 ‘Paulo must win the game. He is always lucky!’

Clearly, (21a) expresses a more rational deduction than (21b). To play better than the adversary is more directly relevant for the expressed deduction than to be a lucky person. However, both examples have the same kind of meaning: the expression of an inference. Likewise, in (20) the modal adverb indicates that the speaker has little evidence directly relevant for the inference expressed by the modal verb, though he has a strong belief that the proposition under the scope of *dever* will be true. In other words, by asserting (20) the speaker asserts that the possibility of the proposition under the scope of *dever* is more likely to be true than to be false, in his opinion, though he has little direct evidence to sustain such belief.

If this analysis is on the right track, a difference exists between the considered modal adverbs and modal verbs: modal verbs express an inference related to the modal base, while the modal adverbs under consideration point to the modal base. Both the modal verbs and the modal adverbs will be quantifiers over possible worlds. Modal verbs quantify over the set of possible worlds that correspond to the possibilities open at each stage of the conversation, modal adverbs being quantifiers over the possible worlds that form the modal base. Thus, it is not surprising that these adverbs may co-occur with modal verbs. They do not have the same function in the clause.

CONCLUSION

Apparently the meaning of the adverbs taken into consideration in this study is related to the degree of belief on the part of the speaker. However, such a view faces several problems. An alternative hypothesis was explored, according to which these adverbs are marks that signal the evidence that sustains a statement. More precisely, the considered adverbs indicate the kind and amount of evidence that the speaker relies on to state the modalised proposition. The fact that, e.g., *possivelmente* signals a lower degree of belief than *certamente* can be seen as a consequence of the fact that the former indicates that the speaker has little evidence to sustain his statement, the latter indicating a greater amount of evidence. Therefore, the fact that *certamente* conveys a higher degree of belief than *possivelmente* is a matter of

7. The relevant reading is the one where the second sentence expresses the reason for the prediction uttered by the first sentence.

inference (following from the indication of the amount of evidence available to the speaker).

This implies that the meaning of the considered adverbs differs from the one of modal verbs. In addition to other differences between modal adverbs and other modal operators (such as the fact that modal verbs have other readings apart from the epistemic one), the considered modal adverbs are quantifiers over the set of possible worlds that form the modal base, the modal verbs being quantifiers over the set of possible worlds available from the modal base. This hypothesis leads to the conclusion that the meaning of morphologically related modal operators (e.g., [*poder*]_V, [*possivelmente*]_{ADV}, [*possibilidade*]_N, [*possível*]_{ADJ}) is not necessarily equivalent.

The analysis of the modal adverbs that were considered also leads to the questioning of the classical division between epistemic and reportative adverbs. Some analysis of modal adverbs from other languages (cf., e.g., Squartini 2007, 2008, 2010, a.o., and Pietrandrea 2005 and 2007) have already shown the need to consider more exhaustively the kind of information that is taken into consideration. Hopefully, this paper also shows that, apart from that, modal adverbs are not of the same kind as other modal operators, such as modal verbs.

Hence, a general overview of modality in natural languages will benefit from a closer look at particular classes of modal operators.

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